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NOAA Technical Report NMFS CIRC-390

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Fishery Publications, Calendar Year 1973: Lists and Indexes

MARY ELLEN ENGETT and LEE C. THORSON

SEATTLE, WA
September 1974

NOAA TECHNICAL REPORTS

National Marine Fisheries Service, Circulars

The major responsibilities of the National Marine Fisheries Service (NMFS) are to monitor and assess the abundance and geographic distribution of fishery resources, to understand and predict fluctuations in the quantity and distribution of these resources, and to establish levels for optimum use of the resources. NMFS is also charged with the development and implementation of policies for managing national fishing grounds, development and enforcement of domestic fisheries regulations, surveillance of foreign fishing off United States coastal waters, and the development and enforcement of international fishery agreements and policies. NMFS also assists the fishing industry through marketing service and economic analysis programs, and mortgage insurance and vessel construction subsidies. It collects, analyzes, and publishes statistics on various phases of the industry.

The NOAA Technical Report NMFS CIRC series continues a series that has been in existence since 1941. The Circulars are technical publications of general interest intended to aid conservation and management. Publications that review in considerable detail and at a high technical level certain broad areas of research appear in this series. Technical papers originating in economics studies and from management investigations appear in the Circular series.

NOAA Technical Reports NMFS CIRC are available free in limited numbers to governmental agencies, both Federal and State. They are also available in exchange for other scientific and technical publications in the marine sciences. Individual copies may be obtained (unless otherwise noted) from D83, Technical Information Division, Environmental Science Information Center, NOAA, Washington, D.C. 20235. Recent Circulars are:

315. Synopsis of biological data on the chum salmon, *Oncorhynchus keta* (Walbaum) 1792. By Richard G. Bakkala. March 1970, iii + 89 pp., 15 figs., 51 tables.

319. Bureau of Commercial Fisheries Great Lakes Fishery Laboratory, Ann Arbor, Michigan. By Bureau of Commercial Fisheries. March 1970, 8 pp., 7 figs.

330. EASTROPAC Atlas: Vols. 1-7. Catalog No. I 49.4:330/(vol.) 11 vols. Available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

331. Guidelines for the processing of hot-smoked chub. By H. L. Seagran, J. T. Graikoski, and J. A. Emerson. January 1970, iv + 23 pp., 8 figs., 2 tables.

332. Pacific hake. (12 articles by 20 authors.) March 1970, iii + 152 pp., 72 figs., 47 tables.

333. Recommended practices for vessel sanitation and fish handling. By Edgar W. Bowman and Alfred Larsen. March 1970, iv + 27 pp., 6 figs.

335. Progress report of the Bureau of Commercial Fisheries Center for Estuarine and Menhaden Research, Pesticide Field Station, Gulf Breeze, Fla., fiscal year 1969. By the Laboratory staff. August 1970, iii + 33 pp., 29 figs., 12 tables.

336. The northern fur seal. By Ralph C. Baker, Ford Wilke, and C. Howard Baltzo. April 1970, iii + 19 pp., 13 figs.

337. Program of Division of Economic Research, Bureau of Commercial Fisheries, fiscal year 1969. By Division of Economic Research. April 1970, iii + 29 pp., 12 figs., 7 tables.

338. Bureau of Commercial Fisheries Biological Laboratory, Auke Bay, Alaska. By Bureau of Commercial Fisheries. June 1970, 8 pp., 6 figs.

339. Salmon research at Ice Harbor Dam. By Wesley J. Ebel. April 1970, 6 pp., 4 figs.

340. Bureau of Commercial Fisheries Technological Laboratory, Gloucester, Massachusetts. By Bureau of Commercial Fisheries. June 1970, 8 pp., 8 figs.

341. Report of the Bureau of Commercial Fisheries Biological Laboratory, Beaufort, N.C., for the fiscal year ending June 30, 1968. By the Laboratory staff. August 1970, iii + 24 pp., 11 figs., 16 tables.

342. Report of the Bureau of Commercial Fisheries Biological Laborabory, St. Petersburg Beach, Florida, fiscal year 1969. By the Laboratory staff. August 1970, iii + 22 pp., 20 figs., 8 tables.

343. Report of the Bureau of Commercial Fisheries Biological Laboratory, Galveston, Texas, fiscal year 1969. By the Laboratory staff. August 1970, iii + 39 pp., 28 figs., 9 tables.

344. Bureau of Commercial Fisheries Tropical Atlantic Biological Laboratory progress in research 1965-69, Miami, Florida. By Ann Weeks. October 1970, iv + 65 pp., 53 figs.

346. Sportsman's guide to handling, smoking, and preserving Great Lakes coho salmon. By Shearon Dudley, J. T. Graikoski, H. L. Seagran, and Paul M. Earl. September 1970, iii + 28 pp., 15 figs.

347. Synopsis of biological data on Pacific ocean perch, *Sebastodes alutus*. By Richard L. Major and Herbert H. Shippen. December 1970, iii + 38 pp., 31 figs., 11 tables.

349. Use of abstracts and summaries as communication devices in technical articles. By F. Bruce Sanford. February 1971, iii + 11 pp., 1 fig.

350. Research in fiscal year 1969 at the Bureau of Commercial Fisheries Biological Laboratory, Beaufort, N.C. By the Laboratory staff. November 1970, ii + 49 pp., 21 figs., 17 tables.

351. Bureau of Commercial Fisheries Exploratory Fishing and Gear Research Base, Pascagoula, Mississippi, July 1, 1967 to June 30, 1969. By Harvey R. Bullis, Jr., and John R. Thompson. November 1970, iv + 29 pp., 29 figs., 1 table.

352. Upstream passage of anadromous fish through navigation locks and use of the stream for spawning and nursery habitat, Cape Fear River, N.C., 1962-66. By Paul R. Nichols and Darrell E. Louder. October 1970, iv + 12 pp., 9 figs., 4 tables.

356. Floating laboratory for study of aquatic organisms and their environment. By George R. Snyder, Theodore H. Blahm, and Robert J. McConnell. May 1971, iii + 16 pp., 11 figs.

361. Regional and other related aspects of shellfish consumption — some preliminary findings from the 1969 Consumer Panel Survey. By Morton M. Miller and Darrel A. Nash. June 1971, iv + 18 pp., 19 figs., 3 tables, 10 apps.

362. Research vessels of the National Marine Fisheries Service. By Robert S. Wolf. August 1971, iii + 46 pp., 25 figs., 3 tables. For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

364. History and development of surf clam harvesting gear. By Phillip S. Parker. October 1971, iv + 15 pp., 16 figs. For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

365. Processing EASTROPAC STD data and the construction of vertical temperature and salinity sections by computer. By Forrest R. Miller and Kenneth A. Bliss. February 1972, iv + 17 pp., 8 figs., 3 appendix figs. For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

366. Key to field identification of anadromous juvenile salmonids in the Pacific Northwest. By Robert J. McConnell and George R. Snyder. January 1972, iv + 6 pp., 4 figs. For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

367. Engineering economic model for fish protein concentration processes. By K. K. Almenas, L. C. Durilla, R.C. Ernst, J. W. Gentry, M. B. Hale, and J. M. Marchello. October 1972, iii + 175 pp., 6 figs., 6 tables. For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

368. Cooperative Gulf of Mexico estuarine inventory and study, Florida: Phase I, area description. By J. Kneeland McNulty, William N. Lindall, Jr., and James E. Sykes. November 1972, vii + 126 pp., 46 figs., 62 tables. For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

369. Field guide to the anglefishes (Pomacanthidae) in the western Atlantic. By Henry A. Feddern. November 1972, iii + 10 pp., 17 figs. For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Continued on inside back cover.

U.S. DEPARTMENT OF COMMERCE
Frederick B. Dent, Secretary
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
Robert M. White, Administrator
NATIONAL MARINE FISHERIES SERVICE
Robert W. Schoning, Director

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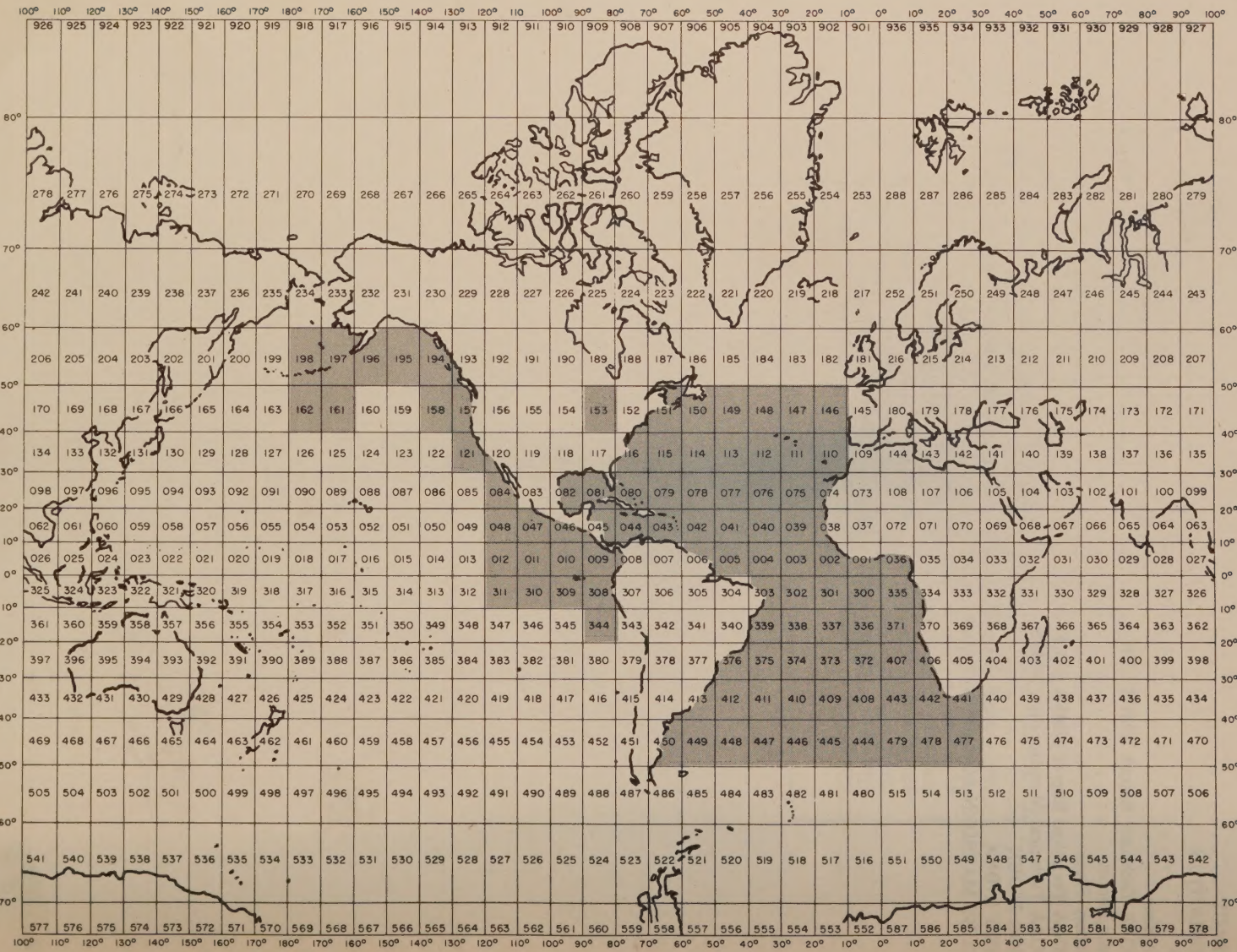

Figure 1.—Marsden square grid showing geographic areas (shaded) covered by fishery publications, calendar year 1973.

Fishery Publications, Calendar Year 1973: Lists and Indexes

MARY ELLEN ENGETT and LEE C. THORSON[1]

ABSTRACT

The folowing series of fishery publications of the National Marine Fisheries Service, National Oceanic and Atmospheric Administration, in calendar year 1973 are listed numerically (with abstracts) and indexed by author, subject, and geographic area: NOAA Technical Report NMFS CIRC (formerly Circular); Data Report; Fishery Facts; NOAA Technical Report NMFS SSRF; and NOAA Technical Memorandum NMFS.

INTRODUCTION

This document provides for calendar year 1973 numerical lists (with abstracts) and indexes by author, subject, and geographical area, of the following series of publications of the National Marine Fisheries Service, National Oceanic and Atmospheric Administration:

Circular
Data Report
Fishery Facts
Special Scientific Report—Fisheries
Technical Memorandum

The document is divided into four principal sections:

Numerical listing of series (with abstracts)
Author index
Subject index
Index by Marsden squares

The last section has been included to afford easy access to the publications for those persons interested in specific geographical areas. Figure 1 shows the Marsden squares treated in the several publications.

The series abbreviations used in the indexes are:

Circular	C
NOAA Technical Report NMFS CIRC	C
Data Report	D
Fishery Facts	FF
NOAA Technical Report NMFS SSRF	S
NOAA Technical Memorandum NMFS	TM

All series except the Data Report and NOAA Technical Memorandum NMFS are available from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402. Prices may be obtained from that office. The Data Report and NOAA Technical Memorandum NMFS are available from the National Technical Information Service.

[1]Scientific Publications Staff, National Marine Fisheries Service, NOAA, Seattle, WA 98105.

LISTS

Circular

330, Vol. 7. EASTROPAC Atlas: Physical Oceanographic and Meteorological Data from Principal Participating Ships and *Oceanographer,* Third and Fourth Monitor Cruises, October 1967-January 1968. By Cuthbert M. Love, (editor). July 1973, vii + 145 figures.

ABSTRACT

This atlas contains charts depicting the distribution of physical, chemical, and biological oceanographic properties and associated meteorological properties observed during EASTROPAC. EASTROPAC was an international cooperative investigation of the eastern tropical Pacific Ocean (20° N. to 20° S., and from the west coasts of the American continents to 119° W.) which was intended to provide data necessary for a more effective use of the marine resources of the area, especially tropical tunas, and also to increase knowledge of the ocean circulation, air-sea interaction, and ecology. The Bureau of Commercial Fisheries (now National Marine Fisheries Service) was the coordinating agency. The field work, from February 1967 through March 1968, was divided into seven 2-month cruise periods. During each cruise period one or more ships were operating in the study area.

On completion of the field work the data seemed too numerous for a classical data report. Instead, it was decided to produce an 11-volume atlas of the results, with 5 volumes containing physical oceanographic and meteorological data from the principal participating ships, 5 volumes containing biological and nutrient chemistry data from the same ships, and 1 volume containing all data from Latin American cooperating ships and ships of opportunity. Extensive use was made of a computer and automatic plotter in preparation of the atlas charts. Methods used to collect and process the data upon which the atlas is based are described in detail by the contributors of the following categories of charts: temperature, salinity, and derived quantities; thickness of the upper mixed layer; dissolved oxygen; meteorology; nutrient chemistry; phytoplankton standing stocks and production; zooplankton and fish larvae; micronekton; birds, fish schools, and marine mammals.

NOAA TECHNICAL REPORT NMFS CIRC

371. Ocean Fishery Management: Discussions and Research. Adam A. Sokoloski, editor. April 1973, vi + 173 pp.

(371.) Ocean Fishery Management: Discussions and Research—The Status of Fisheries Management Research: An Overview. By Adam A. Sokoloski. April 1973, vi + 1-6 pp.

(No abstract)

(371.) Ocean Fishery Management: Discussions and Research—Problems in Implementing New Fishery Management Programs. By Lawrence W. Van Meir. April 1973, pp. 9-11.

ABSTRACT

Even though an "optimum" management program, in an economic sense, may never be achievable in the management of commercial fisheries, changes can be initiated which will allow individual governments to realize economic gains over the status quo in harvesting common property fishery resources. These changes primarily involve jurisdictional issues; country quotas for international fisheries; accord between the Federal government and the states; and a within-industry system for allocating fishing rights. A system of vessel licensing is described with reference to the ultimate use of licenses on units of fishing effort.

(371.) Ocean Fishery Management: Discussions and Research—On the Utility of Bioeconomic Models for Fisheries Management. By Giulio Pontecorvo. April 1973, pp. 12-22, 1 table.

ABSTRACT

Short run and long run biological and economic models are inevitably bound together in any comprehensive plan to manage commercial fisheries. While these disciplines can be treated rigorously, political and social considerations can be considered only generally and therefore on an ad hoc basis. Within this framework long run models are useful primarily for goal setting. More work must be done in developing short run models which will measure the immediate biological and economic impacts of alternative management steps in addition to immediate political and social ramifications. Emphasis would then be placed upon the economic sources of short run instability, with an initial economic rationalization of the fishery providing the funds for subsequent management and biological forecasting which will concentrate on extending management from a rationalized fishery at a given harvesting level to rationalized fishing at some optimum level.

(371.) Ocean Fishery Management: Discussions and Research—Multiple Objectives for Marine Resource Management. By R. Bruce Rettig. April 1973, pp. 23-27.

ABSTRACT

Management decisions suggested by recent bioeconomic models have been largely disregarded by fishery managers. This negligible impact may be due to error on the part of management, an incomplete grasp of the role of noneconomic objectives, and/or the possibility that more sophisticated economic models might yield markedly different results. More sophisticated models are suggested which consider the problem of second best, risk and uncertainty, transaction and adjustment costs, and income redistribution. Creation of analytical systems amenable to treatment of noneconomic variables along with economic variables is suggested.

(371.) Ocean Fishery Management: Discussions and Research—Economic, Political, and Social Barriers to Efficiency in Selected Pacific Coast Fisheries. By James A. Crutchfield. April 1973, pp. 28-38, 2 figures.

ABSTRACT

Multidisciplinary models are being developed for the salmon, halibut, king crab and anchovy fisheries as an aid in fisheries management. These models will provide estimates of economic rent in these fisheries, with an evaluation of alternative management structures available to capture these net benefits. The character of the models for each of these differing fisheries is described, including reference to the nature of the products, markets, processors, harvesters, regulators, stocks, and locations sectors of these fisheries. Introductory observations are made on the future role of multifishery modeling studies.

(371.) Ocean Fishery Management: Discussions and Research—Cross Section Production Functions for North Atlantic Groundfish and Tropical Tuna Seine Fisheries. By Ernest W. Carlson. April 1973, pp. 42-56, 3 tables, 4 app. tables.

ABSTRACT

This paper explores the use of cross section production functions to estimate the fishing power of individual vessels. The problems addressed are: The proper measurement of output; the measurement of technological change, and the effect of location, crew size and important vessel characteristics.

Regression analysis upon data from the North Atlantic groundfish fishery and the tropical tuna sein fishery yielded highly significant results. Many of the hypothesized relationships are measureable and stable with relatively small errors. The tests indicate that: there are better measures of output than total pounds; fishing time is measured better using days absent rather than days fishing; the use of more vessel characteristics improves explanatory power; crew size can be an important variable; the effects of location can be measured; and technological change can be measured.

The production functions measured can then be used as inputs in devising management schemes.

(371.) Ocean Fishery Management: Discussions and Research—Optimal Fishing Effort in the Peruvian Anchoveta Fishery. By Edilberto L. Segura. April 1973, pp 57-64, 3 figs., 1 table.

ABSTRACT

This paper introduces a new approach to measuring technical change, increased skills of the skipper and the fishermen, water temperature, etc., to obtain a better measure of fishing effort and therefore a revised estimate of the optimum quantity to be landed. The revised technique used adjusts the level of landings to an index rather than the level of fishing effort, indicating the level of landings that would have resulted in previous periods if the current landings/effort relationship is used.

The revised yield/effort relationship which results yields 16.2 million ton-trips as the optimal fishing effort, as opposed to the 23 million ton-trips which were obtained without this measure of technical change.

(371.) Ocean Fishery Management: Discussions and Research—Natural Resources and External Economics: Regulation of the Pacific Halibut Fishery. By Jack Rich. April 1973, pp. 65-71, 5 figures.

ABSTRACT

In a static, long run competitive equilibrium framework, a catch function allowing for short run diminishing returns is combined with a fish growth function developed by Pella and Tomlinson which facilitates the derivation of an expression for the long run marginal cost of "effort" in a common property resource such as a fishery. This expression takes into account both "congestion" and "growth" costs. The diagramatic technique of Crutchfield and Zellner is modified to take account of these externalities. The modified Crutchfield-Zellner diagrams are used to illustrate the potential economic losses from maximum sustainable yield regulation or other nonoptimal output.

(371.) Ocean Fishery Management: Discussions and Research—Production from the Sea. By Frederick W. Bell, Ernest W. Carlson, and Frederick V. Waugh. April 1973, pp. 72-91, 9 figs., 5 tables.

ABSTRACT

The sea constitutes a common property resource which causes factor productivity to be heavily influenced by technological externalities. The sea is also subject to the spectre of Malthusian scarcity since man cannot manipulate the ocean environment (Barnett and Morse, 1963). We estimated the parameters using ordinary least squares of the dynamic Schaefer production model of the intervention of man into the oceanic ecosystem. A second production model for the sea to specify diminishing returns to capital and labor for any fixed biomass was developed. The parameters of the latter model were estimated by a computer search technique. The results indicate that the industry production function for marine life is subject to diminishing physical returns to capital and labor. For the cases considered in this study it also appears that the parabolic yield function developed by Schaefer, assuming constant returns to factors inputs, is not as realistic as a production function with diminishing returns to inputs with a given biomass.

(371.) Ocean Fishery Management: Discussions and Research—Some Suggestions for the Development of a Bioeconomic Theory of the Fishery. By Russell G. Thompson. April 1973, pp. 92-95.

ABSTRACT

In this study, the fundamental characteristics of the Schaefer model and the Thompson-George (TG) production-investment model are reviewed, and extensions of the TG model are discussed. It is then indicated how a bioeconomic model for the sole ownership fishery may be obtained by adjoining the Schaefer model to the TG model (or any of the extensions). This leads into a discussion of the fundamental variables in a dynamic analysis of the fishery problem and the limitations of published bioeconomic analyses. It is further pointed out that further work needs to be directed to the formulation of catch functions allowing for varying marginal returns with respect to fishing effort, in particular.

(371.) Ocean Fishery Management: Discussions and Research—Practical Problems of Constructing Bioeconomic Models for Fishery Management. By Paul Adam. April 1973, pp. 96-103, 5 figures.

ABSTRACT

In many practical cases it is impossible to construct a complete bioeconomic model of a given fish stock, such as when one or several fleets move irregularly from one stock to another, or when fishing effort increases so rapidly that it is not possible to accurately specify a reliable yield/effort relationship. A continuing bioeconomic model is proposed here which will allow inclusion of these dimensions while allowing both for year-to-year fluctuations in managed effort and also for gradual adjustment of labor and capital to those levels designated as optimal within the broad ranges of this continuing model. Year-to-year re-evaluation of fish stocks and capital-labor requirements is stressed.

(371.) Ocean Fishery Management: Discussions and Research—Management of the Peruvian Anchoveta Resource. By Andreas A. Holmsen. April 1973, pp. 106-111.

ABSTRACT

The best available estimate of the maximum sustainable yield of the Peruvian anchoveta resource is 9.5 million metric tons (±1 million). The productive capacity of the purse-seine fleet and the fishmeal factories far exceed this tonnage with the result that the open season is becoming shorter year by year. This paper describes the current fishery management program in Peru and the degree of overinvestment in the industry. It further outlines the alternative methods which can be used to reduce excess capacity in the catching and processing phase and the advantages and disadvantages of the various alternatives.

(371.) Ocean Fishery Management: Discussions and Research—A Stochastic Investment Model for a Survival Conscious Fishing Firm. By Russell G. Thompson, Richard W. Callen, and Lawrence C. Wolken. April 1973, pp. 112-120, 3 tables, 3 app. tables.

ABSTRACT

In this study, the stochastic investment model for a survival conscious firm developed by Thompson and George (1970) is extended to take into account income taxes and depreciation of the capacity. This model is applied to shrimp fishing on the Texas Gulf coast. Values of the parameters, as in the deterministic application by Thompson et al. (1970), were based on proprietory information, current market conditions, and present institutional restrictions. The effect of growth in real per capita income on shrimp prices is estimated, and two different rates of income growth are analyzed. Solutions to six problems based on two different sets of random sequences are computed and discussed. The results indicate the effect of the survival constraint on investment decisions, and the importance of revealed information in decision-making.

(371.) Ocean Fishery Management: Discussions and Research—Simulation Experiments to Evaluate Alternative Hunting Strategies for a Deer Population. By F. M. Anderson, G. E. Connolly, A. N. Halter, and W. M. Longhurst. April 1973, pp. 121-132, 6 figs., 1 table.

ABSTRACT

A population dynamics model of the deer herd in Mendocino County, California, is presented. Environmental influences are modeled as density dependent birth and death rate functions. The computer program for this biomanagement model is outlined and validity checks devised to improve the model are discussed. The output shows the impact of selected hunting strategies on productivity, natural mortality, and other population characteristics. Tests of hunting strategies related to alternative management goals are summarized. Implications of computer simulation methodology for the management of wildlife and fish populations are discussed.

(371.) Ocean Fishery Management: Discussions and Research—Augmentation of Salmon Stocks through Artificial Propagation: Methods and Implications. By Joe B. Stevens and Bruce W. Mattox. April 1973, pp. 133-145, 4 figs., 5 tables.

ABSTRACT

Eighty-one hatcheries on the Pacific Coast now rear significant numbers of salmon and steelhead for sport and commercial fisheries. Annual operation and maintenance costs amount to $6.6 million. A production function analysis of 15 Oregon Fish Commission hatcheries produced tentative conclusions that (a) controlled inputs were combined in fixed proportions, (b) constant returns to size were realized, and (c) some degree of factor substitution existed between the controlled "fixed proportion input" and water temperature. The latter relationship may allow hatchery managers to improve efficiency at the hatchery level. Uncertainty with respect to downstream environmental conditions, however, must be considered along with returns to size for the hatchery production function when new investments are undertaken.

Fixed asset theory was used to conceptualize exit and entry of salmon harvesting resources between 1947 and 1966. Net entry followed years of good catches, but net exit did not occur following the bad years. If a major objective of hatchery programs is to augment fishermen's incomes, consideration must be given to increasing the opportunity costs of extant resources as well as to limiting entry of new resources.

(371.) Ocean Fishery Management: Discussions and Research—Limited Entry: The Case of the Japanese Tuna Fishery. By E. A. Keen. April 1973, pp. 146-158, 3 figures.

ABSTRACT

Limited entry has been advocated strongly as an important but as yet unused management tool for U.S. fisheries. Japan has maintained a policy of limiting entry into its high seas fisheries since 1949 and thus has considerable experience of potential value to the use of this tool in U.S. fisheries. This paper presents an assessment of the limited entry system as it has been developed for the Japanese tuna fisheries. Attention is given to effects on the acquisition of capital and overall allocation of national resources, specific effects on the size and nature of the fleet, pressures to permit additional entry, and effects on the location of shore-based activities. Special attention is given to problems that were unforeseen at the time of the initiation of limited entry that, with experience, could have been avoided. The paper is based largely on field research conducted in 1963 and 1964.

(371.) Ocean Fishery Management: Discussions and Research—A Study of the Socioeconomic Impact of Changes in the Harvesting Labor Force in the Maine Lobster Industry. By A. M. Huq. April 1973, pp. 159-173, 1 fig., 13 tables.

ABSTRACT

The basic question of the mobility of the labor force in the Maine lobster fishery is investigated with particular emphasis on the productivity of control groups within a sample and their social, educational, economic, and demographic characteristics. Under various assumptions which would lead to exit from the fishery of these groups certain consequences are enumerated, both with regard to those leaving and those remaining as well as the impact on and role of the local communities involved. A preliminary assessment of the impact of certain types of management programs upon the labor component of the harvesting sector is presented.

372. Published in 1972.

373. Number not assigned.

374. Marine Flora and Fauna of the Northeastern United States. Annelida: Oligochaeta. By David G. Cook and Ralph O. Brinkhurst. May 1973, iii + 23 pp., 82 figures.

ABSTRACT

The manual includes an introduction on the general biology, an illustrated key, an annotated systematic list, a selected bibliography, and an index to the marine Oligochaeta of the East Coast of North

America. The families Naididae, Tubificidae, Enchytraeidae, and Megascolecidae are treated.

375. New Polychaeta from Beaufort, with a Key to All Species Recorded from North Carolina. By John H. Day. July 1973, xiii + 140 pp., 18 figs., 1 table.

ABSTRACT

Over 6,000 polychaete worms belonging to 229 species were collected on a transect running from the sandy shore near Beaufort, N.C., to the upper part of the continental slope in 200 m. Eleven more species were collected from the shores of Beaufort Sound and from grab samples in 400, 600, and 3,020 m off North Carolina. The whole collection includes 19 new species, 2 new subspecies, and 16 new records for the United States. These have been described. An examination of the literature revealed that a further 83 species had been recorded by earlier workers so that a total of 323 species of polychaete worms are now known from North Carolina. Keys have been constructed to cover the whole fauna, all original records have been listed, and references to good descriptions of each species are given. During the course of the work several type specimens were examined and this has resulted in certain changes in nomenclature and the redefinition of certain genera in the families Orbiniidae, Flabelligeridae, and Ampharetidae.

376. Bottom-Water Temperatures on the Continental Shelf, Nova Scotia to New Jersey. By John B. Colton, Jr. and Ruth R. Stoddard. June 1973, iii + 55 pp., 15 figures.

(No abstract)

377. Published in 1972.

378. Marine Flora and Fauna of the Northeastern United States. Protozoa: Ciliophora. By Arthur C. Borror. September 1973, iii + 62 pp., 5 figures.

ABSTRACT

This manual includes an introduction on the general biology, an illustrated key, an annotated systematic list, a selected bibliography, and an index to the marine ciliated Protozoa of coastal and estuarine waters of New England. The key facilitates identification to family of nonencysted, nondividing marine ciliates at any stage in the life cycle.

379. Fishery Publications, Calendar Year 1969: Lists and Indexes. By Lee C. Thorson and Mary Ellen Engett. April 1973, iv + 31 pp., 1 figure.

ABSTRACT

The following series of fishery publications of the National Marine Fisheries Service, National Oceanic and Atmospheric Administration (until October 1970 the Bureau of Commercial Fisheries of the U.S. Fish and Wildlife Service) in calendar year 1969 are listed numerically (with abstracts) and indexed by author, subject, and geographic area: Circular, Data Report, Fishery Industrial Research, Fishery Leaflet, and Special Scientific Report—Fisheries.

380. Fishery Publications, Calendar Year 1968: Lists and Indexes. By Mary Ellen Engett and Lee C. Thorson. May 1973, iv + 24 pp., 1 figure.

ABSTRACT

The following series of fishery publications of the National Marine Fisheries Service, National Oceanic and Atmospheric Administration (until October 1970 the Bureau of Commercial Fisheries of the U.S. Fish and Wildlife Service) in calendar year 1968 are listed numerically (with abstracts) and indexed by author, subject, and geographic area: Circular, Data Report, Fishery Industrial Research, Fishery Leaflet, and Special Scientific Report—Fisheries.

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ABSTRACT

The following series of fishery publications of the National Marine Fisheries Service, National Oceanic and Atmospheric Administration (until October 1970 the Bureau of Commercial Fisheries of the U.S. Fish and Wildlife Service) in calendar year 1965 are listed numerically (with abstracts) and indexed by author, subject, and geographic area: Circular, Data Report, Fishery Industrial Research, Fishery Leaflet, and Special Scientific Report—Fisheries.

384. Marine Flora and Fauna of the Northeastern United States. Higher Plants of the Marine Fringe. By Edwin T. Moul. September 1973, iii + 60 pp., 1 plate, 109 figures.

ABSTRACT

The common higher plants of the beaches, dunes, morainal cliffs, and tidal marshes of Southern New England are treated in an illustrated key, using only vegetative characters. Both scientific and common names are given. Habitat lists of the plants are included, presenting to the investigator the association of plants as they occur in nature. The range of each plant along the Atlantic coast is designated. A glossary of terms is included.

385. Fishery Publications, Calendar Year 1972: Lists and Indexes. By Lee C. Thorson and Mary Ellen Engett. November 1973, iv + 23 pp., 1 figure.

ABSTRACT

The following series of fishery publications of the National Marine Fisheries Service, National Oceanic and Atmospheric Administration, in calendar year 1972 are listed numerically (with abstracts) and indexed by author, subject, and geographic area: NOAA Technical Report NMFS CIRC (formerly Circular); Data Report; Fishery Facts; NOAA Technical Report NMFS SSRF; and NOAA Technical Memorandum NMFS.

386. Marine Flora and Fauna of the Northeastern United States. Pycnogonida. By Lawrence R. McCloskey. September 1973, iii + 12 pp., 1 figure.

ABSTRACT

The manual includes an introduction on the general biology, an illustrated key, an annotated systematic list, a selected bibliography, and an index to the Pycnogonida along the coast of the United States from Maine to New Jersey out to 100 m.

DATA REPORT

(Hard copies and microfiche copies of Data Reports are for sale by the U.S. Department of Commerce, National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22151.)

75. Physical-chemical oceanographic data from the North Pacific Ocean and Bering Sea, 1971. By W. James

Ingraham, Jr., Donald M. Fisk, Charles J. Bartlett, and Stephen E. Turner. February 1973, 169 pp. on 3 microfiche.

ABSTRACT

Temperature and salinity data were obtained in the North Pacific Ocean at 176 stations in 1971 during spring and autumn cruises of the RV *George B. Kelez* south of the Aleutian Islands, in the Bering Sea, and along the coasts of Washington and British Columbia. Values were obtained from STD traces at standard depths to 1,000 m (spring data) or 1,500 m (autumn data). Computations of density (sigma-t), sound velocity, anomaly of specific volume, and dynamic height, which were performed by a shipboard PDP-8 computer, are also presented. The autumn data tabulations were obtained automatically through a new computer interface.

76. Published in 1972.

77. Hydrographic Observations in Tampa Bay, Florida—1970. By Carl H. Saloman. June 1973, 246 pp. on 4 microfiche.

ABSTRACT

Hydrographic data include water temperature, salinity, total phosphorus, total Kjeldahl nitrogen, pH, dissolved oxygen, turbidity, water transparency, chlorophyll *a*, *b*, and *c*, astacin and nonastacin carotenoids, and primary productivity based on chlorophyll *a*. Also included are hourly observations of rainfall, air and water temperature, and wind direction and velocity for October through December. Methods of collecting and analyzing samples are indicated. Tables summarize data collected from 30 permanent stations by mean, range, and number of observations according to month and area. Other tables summarize the mean, range, and number of observations of samples taken twice daily at the Laboratory dock.

78. Hydrographic Observations in the Gulf of Mexico off Pinellas County, Florida (November 1970 - January 1972). By Carl H. Saloman. June 1973, 224 pp. on 4 microfiche.

ABSTRACT

Hydrographic data include water temperature, salinity, total phosphorus, total Kjeldahl nitrogen, pH, dissolved oxygen, turbidity, water transparency, chlorophyll *a*, *b*, and *c*, astacin and nonastacin carotenoids, and primary productivity based on the chlorophyll *a* extraction. Methods of collecting and analyzing samples are described. Tables summarize data collected at 33 monthly hydrographic stations, 34 plankton stations, 9 beach-seine stations, 9 gill-net stations, and observations from 3 commercial fishing piers by monthly mean, range, and number of observations.

79. Trawl Catches and Oceanographic Data from the NMFS Groundfish Survey in the Eastern Bering Sea, 1972. By Robert J. Wolotira, Jr. September 1973, 108 pp. on 2 microfiche.

ABSTRACT

Trawl catch and oceanographic data collected from the NOAA RV *Oregon* during the 1972 National Marine Fisheries Service (NMFS) eastern Bering Sea groundfish survey are presented. A total of 103 stations was sampled from May 26 to July 25. Station data are arranged in a tabular form and provide information on location, depth, time and distance trawled, type of fishing gear used, and species catch by weight. Bottom temperatures and salinities for each station are also included.

80. Physical Oceanographic Data from the North Pacific Ocean, 1972. By W. James Ingraham, Jr. and Donald M. Fisk. October 1973, 131 pp. on 3 microfiche.

ABSTRACT

Data on temperature and salinity versus depth were obtained from the RV *George B. Kelez* near Kodiak Island at 127 STD (salinity/temperature/depth) stations during April and May 1972. Values were digitized automatically during descent of the STD sensors to 1,500 m and stored on magnetic tape on-line with a shipboard PDP-8 computer. Secondary processing produced corrected temperature and salinity values and computations of sigma-t, sound velocity, anomaly of specific volume, and dynamic height—all of which are presented by standard depths.

81. Expendable Bathythermograph Observations from the NMFS/MARAD Ship of Opportunity Program for 1971. By Steven K. Cook. November 1973, 132 pp. on 3 microfiche.

ABSTRACT

Results of the first year of operation of the NMFS/MARAD Ship of Opportunity Program in the form of horizontal and vertical distributions of temperature are presented. Operational procedures and problems and data management also are discussed.

FISHERY FACTS

5. Sportsman's Guide to Handling, Smoking, and Preserving Coho Salmon. By Shearon Dudley, J. T. Graikoski, H. L. Seagran, and Paul M. Earl. June 1973, 28 pp., 15 figures.

(No abstract)

6. Alaska's Fishery Resources—the Dungeness Crab. By David T. Hoopes. November 1973, 14 pp., 6 figures.

ABSTRACT

Dungeness crabs, *Cancer magister*, occur in the inshore waters of the west coast of the United States and Alaska. Alaska production has averaged 9.2 million pounds annually since 1960; the yearly average value to the fishermen was between $1 and $2 million. A female may lay up to 1.5 million eggs, which adhere to small appendages under her abdomen until they hatch 7 to 10 mo later. After hatching, the minute larvae spend 3 to 4 mo in the water column as plankton. At the end of their planktonic development period, the larvae settle to the bottom and transform into juvenile crabs. Dungeness crabs grow only during the molting period. Males may live for 8 yr and attain 10 inches in width; females are considerably smaller. The commercial fishery takes only male crabs, which are caught in baited pots. Crabs are either delivered to market alive or are cooked and prepared in several ways. In Alaska the State Department of Fish and Game is responsible for conducting research required for rational management and protection of this valuable shellfish resource.

NOAA TECHNICAL REPORT NMFS SSRF

661. A Review of the Literature on the Development of Skipjack Tuna Fisheries in the Central and Western Pacific Ocean. By Frank J. Hester and Tamio Otsu. January 1973, iii + 13 pp., 1 figure.

ABSTRACT

There has been a rapid acceleration in efforts to develop skipjack tuna fisheries in the central and western Pacific. This is because the resources of the larger tunas (yellowfin, bigeye, bluefin, and albacore) are already being fished at or near the maximum sustainable level. The greatest potential for increased harvest appears to be the skipjack resource. To assist the skipjack development effort, pertinent information on the subject is summarized and a bibliography of selected references is included.

662. Seasonal Distribution of Tunas and Billfishes in the Atlantic. By John P. Wise and Charles W. Davis. January 1973, iv + 24 pp., 13 figs., 4 tables.

ABSTRACT

Charts of the Atlantic Ocean for each quarter of the year—January-March, etc.—show the distribution of 10 species and groups of species fished by the Japanese Atlantic longline fishery in the years 1956-68. These charts are based on detailed catch and fishing effort data published by the Japanese Government. Quarterly average catch per unit of effort was calculated for each 5° × 5° square, and contour lines were drawn through equal levels of catch per unit of effort. The text explains the calculation and contouring processes in detail, and has a section of remarks and explanation for each of the 10 species or groups.

663. Published in 1972.

664. Published in 1972.

665. Published in 1972.

666. Distribution and Relative Abundance of Fishes in Newport River, North Carolina. By William R. Turner and George N. Johnson. September 1973, iv + 23 pp., 1 fig., 13 tables.

ABSTRACT

Monthly sampling in Newport River during 1970 disclosed a total of 104 species of fishes within the system. Sampling extended from the lower reaches of the estuary upstream into tidal fresh waters, and covered a mid-channel distance of 34.87 km. To sample as wide a range of species as possible, an array of collecting gear was used, i.e., haul seine, surface trawl, bottom trawls (two sizes), and gill nets. In terms of catch per unit of effort the surface trawl was the most successful gear employed, whereas gill nets, the least efficient gear, captured the greatest variety of species.

Most of the species of fishes collected in the system were marine forms. Only 15 essentially freshwater species were collected and 5 of these (longnose gar, gizzard shad, golden shiner, white catfish, and black crappie) showed varying degrees of tolerance for saline waters (0.6-33.7 ‰).

Relative numbers of fishes in collections by the different gears indicated that seven species made up 97% of the total catch which comprised nearly 129,000 individuals. The dominant species were all marine euryhaline forms that used the estuary as a nursery area, penetrating well upstream into brackish or even tidal fresh waters. Seasonal distribution and abundance of the dominant species, as well as other species collected in substantial numbers, are discussed.

Biomass of fishes in collections by haul seine was estimated at 0.93 g/m^2 for littoral waters of the estuary. Samples collected by other gears did not yield satisfactory estimates of biomass.

667. An Analysis of the Commercial Lobster (*Homarus americanus*) Fishery Along the Coast of Maine, August 1966 Through December 1970. By James C. Thomas. June 1973, v + 57 pp., 18 figs., 11 tables.

ABSTRACT

We have used some life history information and detailed catch and effort data from probability sampling of the commercial catch of lobsters to estimate a biological minimum size of 89-mm (3½ inches) carapace length for maximum sustainable yield. In view of this recommendation, the maximum size regulation of 127-mm (5 inches) carapace length is unnecessary.

668. An Annotated Bibliography of the Cunner, *Tautogolabrus adspersus* (Walbaum). By Fredric M. Serchuk and David W. Frame. May 1973, ii + 43 pp.

ABSTRACT

This annotated, indexed bibliography of the cunner contains 347 entries including references on taxonomy, distribution, life history, physiology, behavior, commercial and sport fisheries, and related fields. It may be considered current through June 1972.

669. Subpoint Prediction for Direct Readout Meteorological Satellites. By L. E. Eber. August 1973, iii + 7 pp., 2 figs., 1 table.

ABSTRACT

The National Environmental Satellite Service (NESS) provides orbital information on meteorological satellites with direct transmission systems, through APT (Automatic Picture Transmission) Predict messages sent over standard weather communications networks. With periodic access to this information, operators of independent APT ground receiving stations can extrapolate, by means of nodal period and nodal increment, to determine future orbits within receiving range of their station. A technique for the prediction of subpoint location along an orbit as a function of time after ascending node was developed from consideration of Kepler's laws and derived expressions for the force due to the earth's gravitational potential. Subpoint latitudes and longitudes computed by this technique are within 0.1 degree of those given in NESS predictions.

670. Unharvested Fishes in the U.S. Commercial Fishery of Western Lake Erie in 1969. By Harry D. Van Meter. July 1973, iii + 11 pp., 6 figs., 6 tables.

ABSTRACT

Potential commercial fish production was estimated for U.S. waters of western Lake Erie in 1969 from pounds landed and pounds discarded. Periodic observations of catches in haul seines and trap nets revealed that about 37% of the catch (by weight) in haul seines and 26% of that in trap nets were low-value fishes that were discarded. Projection of these discarded catches to include the total fishing effort indicated that an additional 2.8 million lb of low-value species would have been landed in 1969 if a reasonable profit had been assured. It is concluded that the sustained yield could be increased considerably with only a moderate increase in fishing effort.

671. Coastal Upwelling Indices, West Coast of North America, 1946-71. By Andrew Bakun. June 1973, iv + 103 pp., 6 figs., 3 tables, 104 app. figures.

ABSTRACT

A series of monthly indices of intensity of large-scale, wind-induced coastal upwelling at selected locations along the west coast of North America is presented for the period 1946 through 1971. The indices are based on calculations of offshore Ekman surface wind transport from monthly mean surface atmospheric pressure data. Summaries by quarter and by year are included.

The effect of using monthly mean pressure data is evaluated by comparison to a similar series of monthly means of transports computed 6-hourly over a 4½-yr period. The correlation between the two series at any particular location was found to be high. However, the slope of the regression line varies at different locations. Also values off southern California during summer may be amplified relative to other locations as a result of the discontinuity in the atmospheric pressure gradient caused by the coastal mountain range between the thermal low in the interior of southern California and the higher pressure offshore. The conclusion is that these series may be satisfactory indicators of temporal variations of upwelling at each location, but less satisfactory indicators of spatial distributions.

672. Seasonal Occurrence of Young Gulf Menhaden and Other Fishes in a Northwestern Florida Estuary. By Marlin E. Tagatz and E. Peter H. Wilkens. August 1973, iii + 14 pp., 1 fig., 4 tables.

ABSTRACT

Gulf menhaden, *Brevoortia patronus*, and other species of fishes were collected by plankton net, seine, and surface trawl from Pensacola Bay, East Bay, and East Bay River from December 1969 to October 1971. Relative abundance, distribution, and relative growth of menhaden are given from the time they enter the estuary as larvae in December to the time they emigrate to the Gulf of Mexico as juveniles in September.

Eighty-four species of fishes, representing 46 families, were captured. The number and length range of each species by month are presented for the areas from which it was caught. Also included are the salinity and temperature ranges at capture. Four species were not previously recorded from Pensacola estuaries.

673. Abundance and Distribution of Inshore Benthic Fauna off Southwestern Long Island, N.Y. By Frank W. Steimle, Jr. and Richard B. Stone. December 1973, iii + 50 pp., 2 figs., 5 app. tables.

ABSTRACT

This paper describes a qualitative and quantitative census of the inshore benthic fauna off southwest Long Island over the period February 1966 through January 1967, prior to construction of an ocean sewer outfall in the general vicinity. Preliminary analyses of data indicate the presence of three distinct communities: 1) an inshore medium to coarse grain sand community dominated by the bivalve, *Tellina agilis*, the amphipod, *Protohaustorius deichmannae*, and the echinoderm, *Echinarachnius parma;* 2) an offshore silty fine sand community dominated by the bivalve, *Nucula proxima*, and the polychaete, *Nephtys incisa;* and 3) a community dominated by the blue mussel, *Mytilus edulis*.

NOAA TECHNICAL MEMORANDUM NMFS

ABFL-1. An Improved Incubator for Salmonids and Results of Preliminary Tests of Its Use. By Jack E. Bailey and William R. Heard. September 1973, iii + 7 pp., 2 figs., 3 tables.

ABSTRACT

The environmental requirements of salmonid eggs and alevins are not fully met in conventional hatchery practices, and the resulting fry are physically and behaviorally different from those produced in nature.

This report describes an incubator that simulates the natural environment while functioning under rigorous climatic conditions with minimal maintenence. Pink salmon fry, *Oncorhynchus gorbuscha*, reared in a laboratory test of this incubator emerged earlier than wild fry and were as heavy as wild fry. Midrun incubator-reared fry were shorter than late run wild fry, but the incubator-reared fry still had 0.6 to 0.9 mg of yolk, whereas the late run wild fry had none. Midrun incubator-reared fry were superior to early run wild fry in ability to resist starvation. A field test established that with little maintenance the incubator can produce fry during the spring and summer.

ABFL-2. A Guide to the Collection and Identification of Presmolt Pacific Salmon in Alaska with an Illustrated Key. By Milton B. Trautman. November 1973, iii + 20 pp., 7 figs., 5 plates.

ABSTRACT

This field and laboratory key contains recommendations for types of equipment needed, instructions for preserving and labeling specimens, and descriptions of the characters used in identifying five species of Pacific salmon. The key is illustrated with six line figures: 1) juvenile salmon, 2) the first gill arch, 3) head with gill arch in situ, 4) first gill arch and eye for comparison with longest rakers, 5) method of counting anal fin rays, and 6) ventral surface of head showing branchiostegals. Five plates of stippled line drawings of five lengths (25 to 110 mm fork length) for each of the five species of Pacific salmon, an annotated opposable key, and a glossary are also included.

NWFC-1 Annotated Bibliography of Interspecific Hybridization of Fishes of the Subfamily Salmoninae. By James R. Dangel, Paul T. Macy, and Fred C. Withler. November 1973, iii + 48 pp.

ABSTRACT

This bibliography of 611 annotated references lists published and unpublished material on hybridization between species of the subfamily Salmoninae and crosses of salmonids with non-salmonids. It does not include crosses within a species. The bibliography is indexed by species for the genera *Brachymystax, Hucho, Oncorhynchus, Salmo, Salmothymus,* and *Salvelinus* and certain non-salmonid species.

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